

REMARKS

Reconsideration and the timely allowance of the pending claims, in view of the forgoing amendments and the following remarks, are respectfully requested.

By this Amendment, claims 1, 11, 18, and 20 are amended. Claim 17 is canceled. Accordingly, after entry of this amendment, claims 1-16 and 18-54 will remain pending.

In the Office Action dated September 22, 2004, the Examiner rejected claims 1-4, 6-8, 11-14, 17-19, 33-36, and 39 under 35 U.S.C. § 102(e) as anticipated by Lai et al. (U.S. Application Publication No. 2004/0014315). Claims 5, 9-10, 13-16, 20-32, 37-38, and 40-54 were rejected under 35 U.S.C. § 103(a) as unpatentable over Lai et al. in view of Pan et al. (U.S. Application Publication No. 2004/0121596). The Applicant respectfully disagrees with both of these rejections and, therefore, respectfully traverses same.

Claim 1 (and claims 2-16 and 18-54, which depend from claim 1) have been amended to recite a method of forming a metal layer on a substrate that combines a number of features including, *inter alia*, exposing the substrate to a reducing gas at a substantially constant flow rate and exposing the substrate to a purge gas at a substantially constant flow rate. None of the references cited by the Examiner, either alone or in combination, disclose or suggest the combination of features are now recited by the claims. Accordingly, the Applicant respectfully requests withdrawal of the rejections.

Lai et al. describes a method for the formation of composite tungsten films. There are two methods described by Lai et al. Referring to Fig. 5, the first method involves the cyclic adsorption of a tungsten-containing precursor and a reducing gas on the substrate. (Lai et al. at paragraph [0050].) Referring to Fig. 6, the second

method involves the same process, except that a constant carrier gas flow is utilized. (Lai et al. at paragraph [0053].) In this second method, Lai et al. clearly states that both the tungsten-containing precursor and the reducing gas are pulsed while the carrier gas is applied at a constant flow. (Lai et al. at paragraph [0059].) Accordingly, Lai et al. does not disclose, among other features, that the reducing gas is held at a substantially constant flow rate. For this reason, among others, Lai et al. does not describe each and every feature of claims 1-16 and 18-54 and, therefore, cannot be relied upon to anticipate claims 1-16 and 18-54.

Moreover, Lai et al. cannot be relied upon, either alone or in combination with any other reference, because it may be said to teach away from claims 1-16 and 18-54. It is respectfully submitted that no one skilled in the art would rely on the teachings of Lai et al., which require (among other things) pulsing of the reducing gas, to arrive at the invention as now recited by claims 1-16 and 18-54.

Pan et al. does not assist the Examiner in rejecting claims 1-16 and 18-54 because it also fails to disclose or suggest a method of forming a metal layer on a substrate that combines a number of features including, *inter alia*, exposing the substrate to a reducing gas at a substantially constant flow rate and exposing the substrate to a purge gas at a substantially constant flow rate.

In contrast to the present invention, Pan et al. describes a source alternating MOCVD process for the deposition of tungsten nitride thin films. To deposit the WN thin film, Pan et al. teaches that a solid precursor, such as tungsten hexacarbonyl W(CO)<sub>6</sub> is carried into the chamber by a gas such as hydrogen. (Pan et al. at paragraph [0013].) The flows of hydrogen (H<sub>2</sub>) and ammonia (NH<sub>3</sub>) are then alternately turned on and off to form the thin film. (Pan et al. at paragraphs [0014] and [0015].) There is nothing in Pan et al., however, that would suggest, among other

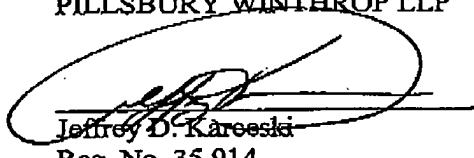
things, forming a metal layer by exposing the substrate to a reducing gas and a purge gas, both of which are provided at a substantially constant flow rate. Accordingly, Pan et al. cannot be combined properly with Lai et al. to render obvious any of claims 1-16 and 18-54.

In view of the forgoing, the Applicant respectfully submits that the claims are patentable over the references applied against them. Accordingly, the Applicant respectfully requests that the Examiner withdraw the rejections of the claims and pass this application quickly to issue.

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Respectfully submitted,

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